Advanced Gun System (AGS) and Long Range Land Attack Projectile (LRLAP)

Joe McPherson

DD(X) AGS Lead Project Engineer

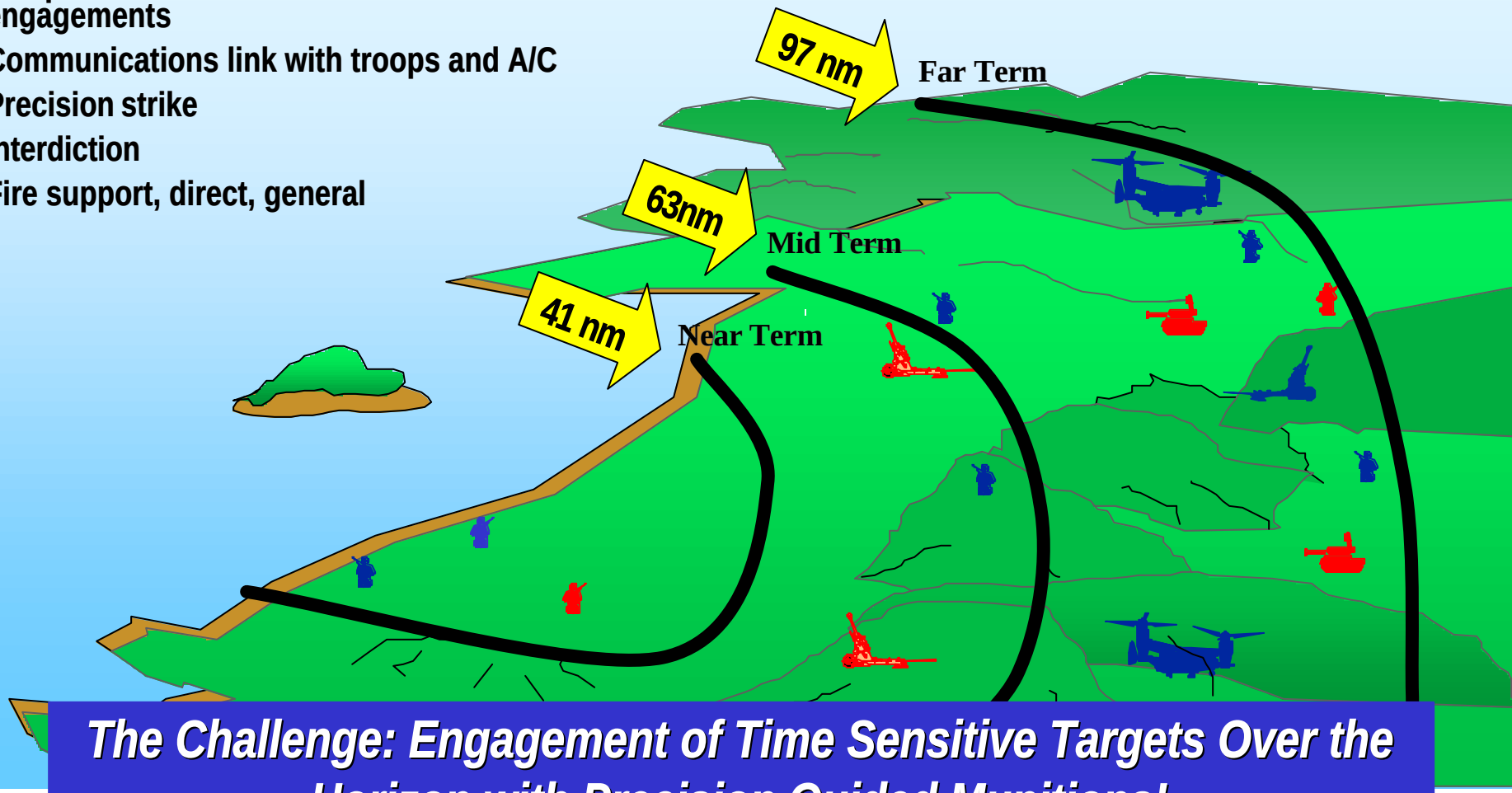
US Navy: Surface Warfare Vision

- Family of surface combatants required to meet future warfighting requirements, not just a single ship class
- Winning the fight requires the ability to conduct assured access and maneuver warfare
- DD(X) is the multi-mission, precision strike and volume fires provider within the family of surface combatants
- The DD(X) Program will focus on risk mitigation of transformational technologies for the Surface Fleet

DD(X) Centerpiece to Transformational 21st Century Navy

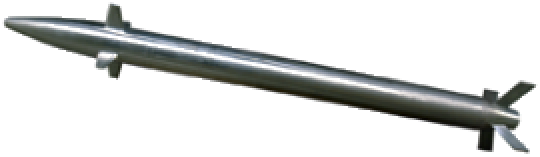
DD(X) Land Dominance Roles

- Support Land Component Commander
- Battle Space Awareness; ID; Deconfliction
- Independent and coordinated engagements
- Communications link with troops and A/C
- Precision strike
- Interdiction
- Fire support, direct, general

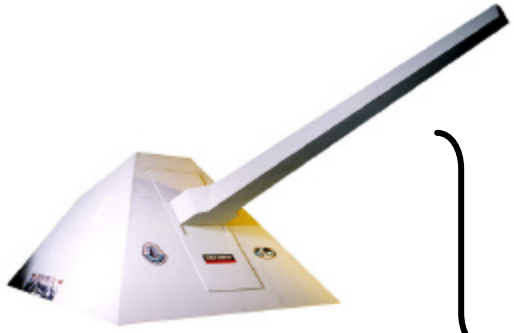


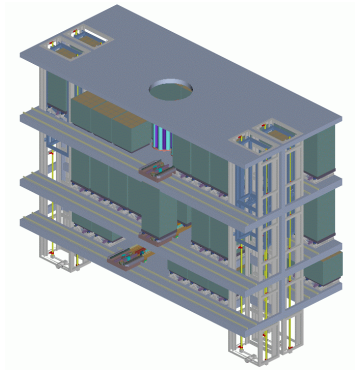
The Challenge: Engagement of Time Sensitive Targets Over the Horizon with Precision Guided Munitions!

Total Ship Systems Engineering



- Range – up to 100nm
- Length – 14.5 cal (“88)
- Weight – 260 lbs
- Palletizaion





- Rate of Fire
- Power
- High Reliability
- Shock Load
- Ship Integration
- Base Ring Diameter
- Automated Operation
- Chamber Volume

- Projectile Length
- ROF - 12 rds / min
- Proj Weight - 260 lbs
- 600 - 750 rds / mag
- Volume
- Ammo Selectivity

- Systems Engineering of projectile, gun, magazine and ship required to optimize DD(X) system
- LRLAP design parameters ultimately affect total ship design

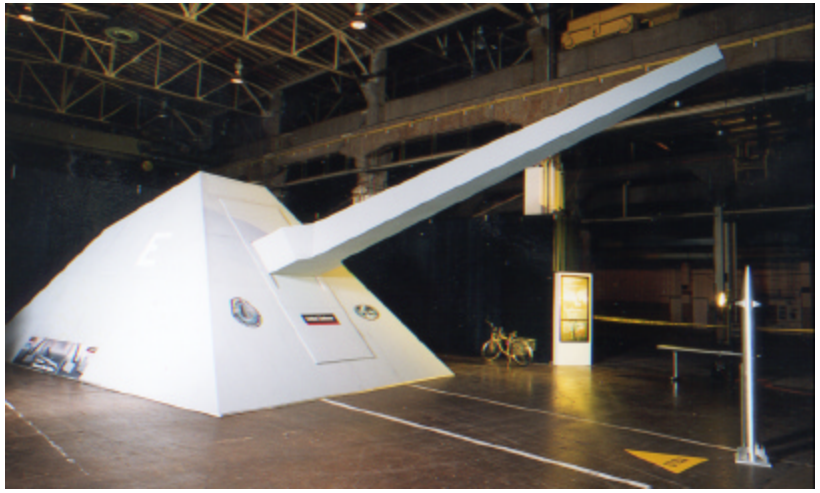
- Effectiveness
- Low Manning
- Weight
- Volume

Requirements Definition

- Sustained ROF
- 2 Gun Systems
- Maximum ROF
- Magazine
- Battery Equivalents
- Range / Accuracy

Battery Equivalents

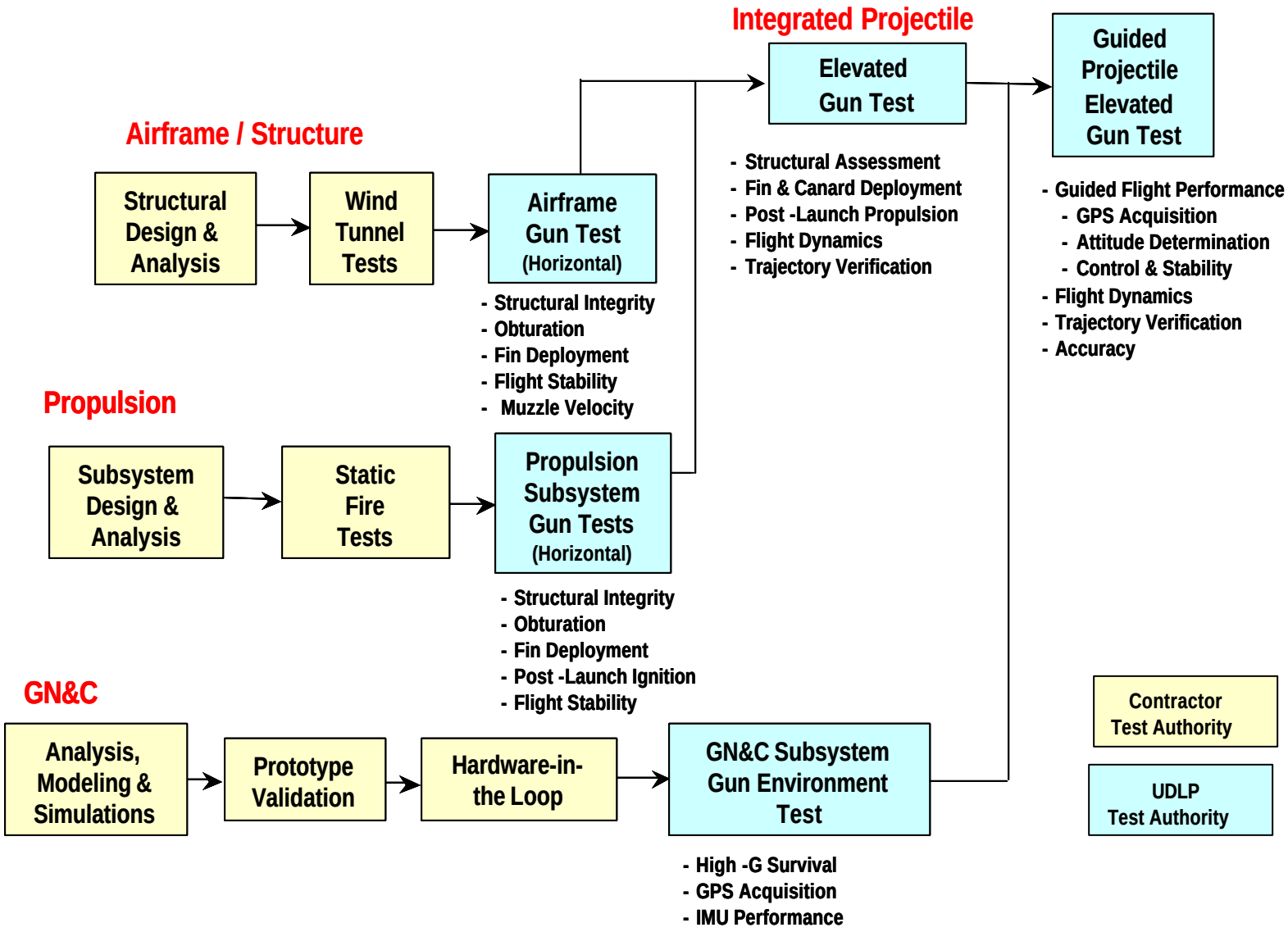
Munitions		Rate of Fire	Throw Weight
Munitions	Warhead	Battery ROF	Quantity / Minute
M795	24 lbs HE	12 rounds / minute	288 lbs HE
M483A1	88 M42 / M46 DPICM	12 rounds / minute	1056 submunitions



AGS LRLAP Program Status

- LRLAP Concept Development (June 99 - April 00)
  - Two Contracts awarded 3QFY99 (Raytheon & SAIC-Lockheed Martin)
  - Completed Development Spec and Interface Control Documents
- LRLAP Risk Reduction Demonstration (May 00 - December 02)
  - Initiate Risk Reduction Subcontracts
    - ★ Awards to SAIC / LM & Raytheon August 00
  - LRLAP Static Rocket Motor tests conducted
  - Competitive Fly-Off
    - ★ Fly to 60 - 70% of Objective Range
    - ★ Planned for 1QFY03
- Planned Initiation of Engineering & Manufacturing Development (E&MD) 2QFY03

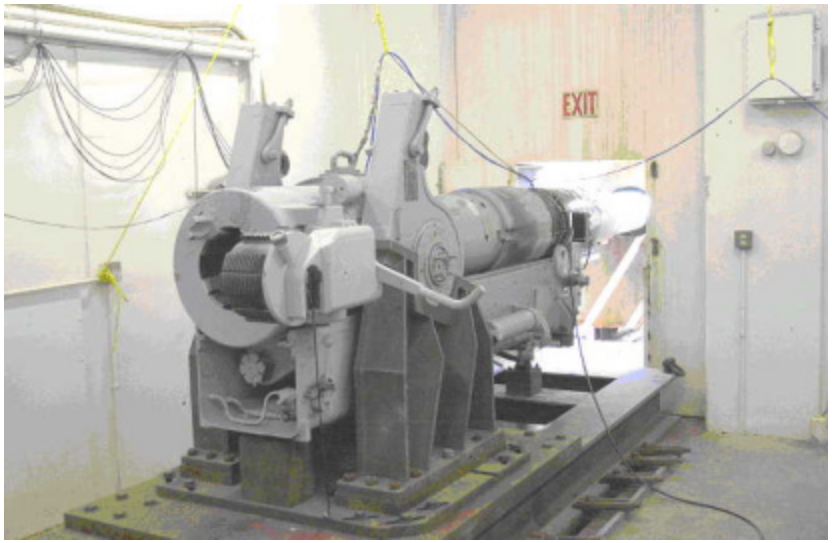
Demonstration Program Milestones



Demonstration Program Progress

- Both subcontractors have completed Airframe tests
- Propulsion subsystem tests planned
- Completed several GNC design, integration, and test activities
- Established initial test sites:
  - UDLP Elk River Proving Grounds – short range tests
  - US Army Dugway Proving Grounds – intermediate range tests
  - Test sites being evaluated for long range tests
  - Completed design, fabrication, and test of two AGS barrels (62-caliber)

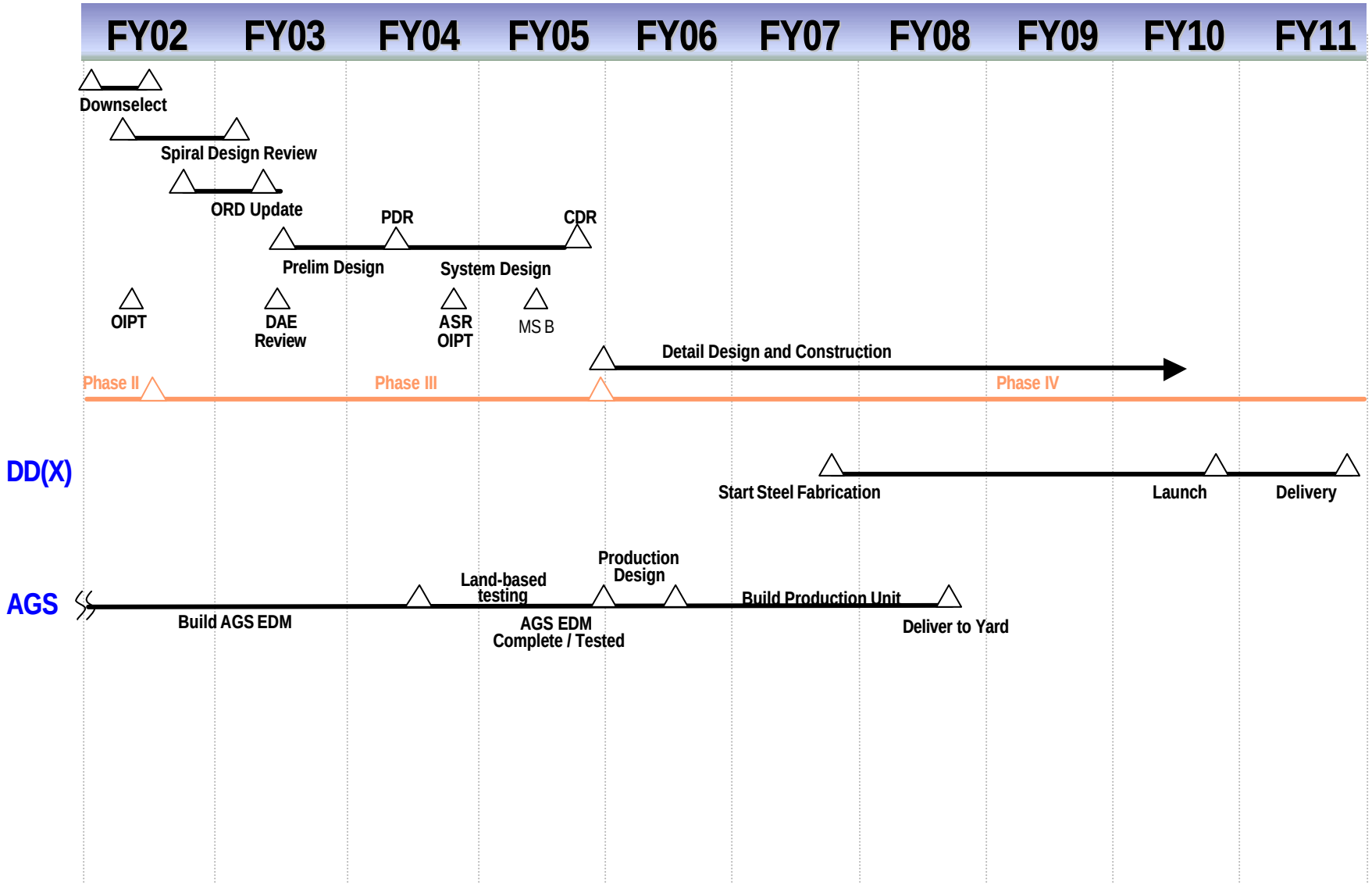
AGS Gun Barrel Test Assets



155mm 62 caliber Test Barrel for test firings at the UDLP Large Caliber test facility in Elk River, MN.

155mm 39 caliber test barrel for munitions testing mounted on a modified M110 8” Self Propelled Howitzer at Dugway Proving Grounds, UT.

DD(X) Flight I Integrated Schedule



Conclusion

- AGS, teamed with LRLAP, will have the ability to respond to a call for fire 24/7 with ordnance on target up to 100nm
- With the capability to provide on demand, timely, lethal, measured effects in a multi-mission environment, the AGS provides the transformational characteristics needed by both the Navy and Marine Corps